FIG. 1

```
gattctcagt agagacgttt gactgtccca acccgatgct gccttcccac ataaatgaga 60

ttttttttctg ccaggcaac atg gtt tta ccc tca tat tca aaa aaa ccc tta  112
                    Met Val Leu Pro Ser Tyr Ser Lys Lys Pro Leu
                      1               5                  10

atc tct aat gtg gag cag ctg atc ctg ggg atc ccg ggc cag aat cgc   160
Ile Ser Asn Val Glu Gln Leu Ile Leu Gly Ile Pro Gly Gln Asn Arg
            15                  20                  25

cgg gag ata ggc cat ggc cag gat atc ttt cca gca gag aag ctc tgc   208
Arg Glu Ile Gly His Gly Gln Asp Ile Phe Pro Ala Glu Lys Leu Cys
        30                  35                  40

cat ctg cag gat cgc aag gtg aac ctt cac aga gct gcc tgg ggc gag   256
His Leu Gln Asp Arg Lys Val Asn Leu His Arg Ala Ala Trp Gly Glu
     45                  50                  55

tgt att gtt gca ccc aag act ctc agc ttc tct tac tgt cag ggg acc   304
Cys Ile Val Ala Pro Lys Thr Leu Ser Phe Ser Tyr Cys Gln Gly Thr
 60                  65                  70                  75

tgc ccg gcc ctc aac agt gag ctc cgt cat tcc agc ttt gag tgc tat   352
Cys Pro Ala Leu Asn Ser Glu Leu Arg His Ser Ser Phe Glu Cys Tyr
                 80                  85                  90

aag agg gca gta cct acc tgt ccc tgg ctc ttc cag acc tgc cgt ccc   400
Lys Arg Ala Val Pro Thr Cys Pro Trp Leu Phe Gln Thr Cys Arg Pro
            95                  100                 105

acc atg gtc aga ctc ttc tcc ctg atg gtc cag gat gac gaa cac aag   448
Thr Met Val Arg Leu Phe Ser Leu Met Val Gln Asp Asp Glu His Lys
        110                 115                 120

atg agt gtg cac tat gtg aac act tcc ttg gtg gag aag tgt ggc tgc   496
Met Ser Val His Tyr Val Asn Thr Ser Leu Val Glu Lys Cys Gly Cys
    125                 130                 135

tct tga gataccccaa agcctcctac tggcctcagg gccacctaag tctcaggact    552
Ser
140

ttagtagggg gtgggattac ttttcatagc aagtagagct ctttgaaggg aggtgggatt 612

tggtttgttt ctcaaagcac agcaagaagg ttggcattat ggcagtaaca aat        665
```

FIG. 2A

```
actagtgatt ctcagtagag acgtttgact gtcccaaccc gatgctgcct tcccacataa 60

atg aga ttt ttt tct gcc agg caa cat ggt ttt acc ctc ata ttc aaa   108
Met Arg Phe Phe Ser Ala Arg Gln His Gly Phe Thr Leu Ile Phe Lys
  1               5                  10                  15

aag aca aag att cca gcc act gat gtc gct gat gcc agc ctg aat gaa   156
Lys Thr Lys Ile Pro Ala Thr Asp Val Ala Asp Ala Ser Leu Asn Glu
             20                  25                  30

tgt tcc agt acc gaa agg aaa caa gac gta gtg ttg ctg ttc gtg acc   204
Cys Ser Ser Thr Glu Arg Lys Gln Asp Val Val Leu Leu Phe Val Thr
         35                  40                  45

ttg tcc cac aca cag cca cct ctg ttt cac ctg cct tat gtc cag aaa   252
Leu Ser His Thr Gln Pro Pro Leu Phe His Leu Pro Tyr Val Gln Lys
     50                  55                  60

ccc tta atc tct aat gtg gag cag ctg atc ctg ggg atc ccg ggc cag   300
Pro Leu Ile Ser Asn Val Glu Gln Leu Ile Leu Gly Ile Pro Gly Gln
 65                  70                  75                  80

aat cgc cgg gag ata ggc cat ggc cag gat atc ttt cca gca gag aag   348
Asn Arg Arg Glu Ile Gly His Gly Gln Asp Ile Phe Pro Ala Glu Lys
                 85                  90                  95

ctc tgc cat ctg cag gat cgc aag gtg aac ctt cac aga gct gcc tgg   396
Leu Cys His Leu Gln Asp Arg Lys Val Asn Leu His Arg Ala Ala Trp
            100                 105                 110

ggc gag tgt att gtt gca ccc aag act ctc agc ttc tct tac tgt cag   444
Gly Glu Cys Ile Val Ala Pro Lys Thr Leu Ser Phe Ser Tyr Cys Gln
        115                 120                 125

ggg acc tgc ccg gcc ctc aac agt gag ctc cgt cat tcc agc ttt gag   492
Gly Thr Cys Pro Ala Leu Asn Ser Glu Leu Arg His Ser Ser Phe Glu
    130                 135                 140

tgc tat aag agg gca gta cct acc tgt ccc tgg ctc ttc cag acc tgc   540
Cys Tyr Lys Arg Ala Val Pro Thr Cys Pro Trp Leu Phe Gln Thr Cys
145                 150                 155                 160

cgt ccc acc atg gtc aga ctc ttc tcc ctg atg gtc cag gat gac gaa   588
Arg Pro Thr Met Val Arg Leu Phe Ser Leu Met Val Gln Asp Asp Glu
                165                 170                 175

cac aag atg agt gtg cac tat gtg aac act tcc ttg gtg gag aag tgt   636
His Lys Met Ser Val His Tyr Val Asn Thr Ser Leu Val Glu Lys Cys
            180                 185                 190

ggc tgc tct tga gataccccaa agcctcctac tggcctcagg gccacctaag       688
Gly Cys Ser
        195
```

FIG. 2B

```
tctcaggact ttagtagggg gtgggattac ttttcatagc aagtagagct ctttgaaggg 748

aggtgggatt tggtttgttt ctcaaagcac agcaagaagg ttggcattat ggcagtaaaa 808

tc                                                                 810
```

FIG. 3

```
                .         .         .         .         .
201 FLEILVKEDRDSGVNFQPEDTCARLRCSLHASLLVVTLNPDQC...HPSR 247
                                :    :.   .:. | :|     | .
  1 .......................MVLPSYSKKPLIS.NVEQLILGIPGQ 25
                .         .         .         .         .
248 KRRAAIPVPKL.SCKNLCHRHQLFINFRDLGWHKWIIAPKGFMANYCHGE 296
     ||       :   . |||     :|     | . |:|||    .|| |
 26 NRREIGHGQDIFPAEKLCHLQDRKVNLHRAAWGECIVAPKTLSFSYCQGT 75
                .         .         .         .         .
297 CPFSLTISLNSSNYAFMQALMHAVDPEIPQ..AVCIPTKLSPISMLYQDN 344
    || .|   |  |.:   :    || |  |     | || .   |:: ||.
 76 CP.ALNSELRHSSF...ECYKRAV.PTCPWLFQTCRPTMVRLFSLMVQDD 120
                .         .
345 NDNVILRHYEDMVVDECGCG 364
      . . :    .|:.|||
121 EHKMSVHYVNTSLVEKCGCS 140
```

Percent Similarity: 36.567 Percent Identity: 26.866

FIG. 4

```
                .         .         .         .         .
151 QEPHVWGQTTPKPGKMFVLRSVPWPQGAVHFNLLDVAKDWNDNPRKNFGL 200
                                                    :   |
  1 ....................................MRFFSARQHGF 11
                .         .         .         .         .
201 FLEILVKEDRDSGVNFQPEDTCARLRCSLHASLLVVTLN...PDQCH... 244
     |     .   . |     . |.          || |||.   |   |
 12 TLIFKKTKIPATDVADASLNECSSTERKQDVVLLFVTLSHTQPPLFHLPY 61
                .         .         .         .         .
245 ...P..SRKRRAAIPVPK...........LSCKNLCHRHQLFINFRDLG 277
       |  |   .  : :|               . |||     :|
 62 VQKPLISNVEQLILGIPGQNRREIGHGQDIFPAEKLCHLQDRKVNLHRAA 111
                .         .         .         .         .
278 WHKWIIAPKGFMANYCHGECPFSLTISLNSSNYAFMQALMHAVDPEIPQ. 326
    | . |:|||    .|| | || .|   |  |.:   :    || |  |
112 WGECIVAPKTLSFSYCQGTCP.ALNSELRHSSF...ECYKRAV.PTCPWL 156
                .         .         .
327 .AVCIPTKLSPISMLYQDNNDNVILRHYEDMVVDECGCG 364
       | || .   |:: ||.   . . :    .|:.|||
157 FQTCRPTMVRLFSLMVQDDEHKMSVHYVNTSLVEKCGCS 195
```

Percent Similarity: 32.941 Percent Identity: 26.471

FIG. 5A

```
tgagaaacac aatctgtatt atcacttctt gcacctccat tctgtaaaca ggagttggta 60

ttgaagttgt tctgggagtg agagtttctc tcacttgaat ttaatttctc ttgaatgcgt 120

gatcagctac aagctgtggg gggttagaat agggcctaca gctgggcacg tggatattta 180

aagacagcga aggggaagcc ccgcttctga gagcaggtat gttggagggt ggctgtggga 240

gaagtggcag ctcctggctc attcctgggc tcttggctct gggtctttgg tgcatgtgtt 300

tgagctcagt agagacgttt gactgtccca acccgatgct gccttcccac ataaatgaga 360

ttttttttctg ccaggcaac atg gtt tta ccc tca tat tca aaa gtaagtagct   413
                    Met Val Leu Pro Ser Tyr Ser Lys                  8

ggagcgctgg tctttgccag ggaaggagtg atccagaagc tgcctggcag cattttgtgg 473

ggctggtcag ggaatggggt gtaaatgaca acagatatta agggctcttg tgagtagagc 533

aaggagttgg gtacagaata ttcttcagct ggtctagcag aaatggaatc tgcttcctgg 593

tttcagctct gcaggcttgg tatgtaggat gtctttaagc tttatggctg atgccctaaa 653

gttctgtgtg taaggatgct ctaaagtgtg aagtacacag ctgctgggct gggcaactat 713

agtgttttgg gagataaaca gggcaagtgg cttgtcttag gtcatggtga ctggaatgat 773

tttcagtact agggcaatca ttctgactta attccagggg tagggtgatg ggagttgagg 833

aacctcagtc catccctggc tgctgtggac taagcactga ctttgacaag ctgagactgc 893

taagtctttg tcctgtcctg cccggctggg tagtggggag taagaagctg aaagggaggt 953

gggactttcc acgatagtgg cctcctggag cttccactct tctttcccta caggctcata 1013

gttcctacac agctactggc ttctctgttt tgaggcagtt tccttcttgg gggtttcctt 1073

gataaagtta tgggcttggg tgcccattgt cccccatgcc actgagcttg ttctagagtt 1133

cgaggaccat agaaggggcc tccaaagatt ccttctggga tctttcccca ttatcttttc 1193

atcctaccag tcagagggag ggtcattatt ggatatctac tgtttactca cgtattggat 1253

ggaggtggtg cccaccctct tggcagagac aaagattcca gccactgatg tcgctgatgc 1313

cagcctgaat gaatgttcca gtaccgaaag gaaacaagac gtagtgttgc tgttcgtgac 1373

cttgtcccac acacagccac ctctgtttca cctgccttat gtccag aaa ccc tta    1428
                                                Lys Pro Leu        11

atc tct aat gtg gag cag ctg atc ctg ggg atc ccg ggc cag aat cgc   1476
Ile Ser Asn Val Glu Gln Leu Ile Leu Gly Ile Pro Gly Gln Asn Arg    27
```

FIG. 5B

```
cgg gag ata ggc cat ggc cag gat atc ttt cca gca gag aag ctc tgc   1524
Arg Glu Ile Gly His Gly Gln Asp Ile Phe Pro Ala Glu Lys Leu Cys     43

cat ctg cag gat cgc aag gtg aac ctt cac aga gct gcc tgg ggc gag   1572
His Leu Gln Asp Arg Lys Val Asn Leu His Arg Ala Ala Trp Gly Glu     59

tgt att gtt gca ccc aag act ctc agc ttc tct tac tgt cag ggg acc   1620
Cys Ile Val Ala Pro Lys Thr Leu Ser Phe Ser Tyr Cys Gln Gly Thr     75

tgc ccg gcc ctc aac agt gag ctc cgt cat tcc agc ttt gag tgc tat   1668
Cys Pro Ala Leu Asn Ser Glu Leu Arg His Ser Ser Phe Glu Cys Tyr     91

aag gtaagacatg gagcctcgtt ctttctcttc tggggtcata ttgggatagc        1721
Lys                                                                92

actaagtgct caactctcta ggcctggctc cttttgagtc aaggaagcca ttgaagttgg 1781

taattatgta atctagcact gatgcagtgt gtagcatctt ccccgccctg tgaccttatc 1841

ccttatcttt attcataaga aacatcagct tcctaaagat tgttctgaaa cagccctgat 1901

ccagcagctt ctccccaggc cctccttctc ccttcccatg tatccctgac aagtctactg 1961

atgcccttag atatgaggct gtggctatga ggcactcacc attctgccat ttgtttctgc 2021

ag agg gca gta cct acc tgt ccc tgg ctc ttc cag acc tgc cgt ccc     2068
   Arg Ala Val Pro Thr Cys Pro Trp Leu Phe Gln Thr Cys Arg Pro      107

acc atg gtc aga ctc ttc tcc ctg atg gtc cag gat gac gaa cac aag   2116
Thr Met Val Arg Leu Phe Ser Leu Met Val Gln Asp Asp Glu His Lys     123

atg agt gtg cac tat gtg aac act tcc ttg gtg gag aag tgt ggc tgc   2164
Met Ser Val His Tyr Val Asn Thr Ser Leu Val Glu Lys Cys Gly Cys     139

tct tga gataccccaa agcctcctac tggcctcagg gccacctaag tctcaggact    2220
Ser  *                                                             140

ttagtagggg gtgggattac ttttcatagc aagtagagct ctttgaaggg aggtgggatt 2280

tggtttgttt ctcaaagcac agcaagaagg ttggcattat ggcagtaacc cctcatagat 2340

gcttctcttt gatgtggcag gggcccccta gtgctgttct cagtcactcc tactactggg 2400

aagctgggcc cattgagatg tctgactatc gctgtcctag attgtgagtg ggctgggctt 2460

agtgccacct ctgggatcat ttaggtgggg aaagaggaac tggaattgga cgcatgtcag 2520

ctcttggggt aggggtaaaa ttgttaccag tgttaagctg gctttggact ctttctgagc 2580

cattcagctg ctatcatcct tctctgtacc attggcctgg ggctggtcca gaactgacct 2640

cagcatgtac attcctcctc acctaacact cctggcctct ttagagggag tgaagactct 2700
```

FIG. 5C

gtggaagaaa gcattctgtc atgggctagt catgggtaaa gggccccaag gccttcacaa 2760

cctggtgtca gatgggagcc tgagagtaga ggatgttgct tgactgacag agggggcctc 2820

tggcctcatg gaaagtttgt ctcactatca tttaaggaac ttgatattag ctttttcact 2880

atctttaata aaactatagg accattgttg tgggtctctt atgttggata tctattactt 2940

FIG. 6A

```
tgagaaacac aatctgtatt atcacttctt gcacctccat tctgtaaaca ggagttggta 60

ttgaagttgt tctgggagtg agagtttctc tcacttgaat ttaatttctc ttgaatgcgt 120

gatcagctac aagctgtggg gggttagaat agggcctaca gctgggcacg tggatattta 180

aagacagcga aggggaagcc ccgcttctga gagcaggtat gttggagggt ggctgtggga 240

gaagtggcag ctcctggctc attcctgggc tcttggctct gggtctttgg tgcatgtgtt 300

tgagctcagt agagacgttt gactgtccca acccgatgct gccttcccac ataa atg   357
                                                          Met     1

aga ttt ttt tct gcc agg caa cat ggt ttt acc ctc ata ttc aaa a     403
Arg Phe Phe Ser Ala Arg Gln His Gly Phe Thr Leu Ile Phe Lys

gtaagtagc tggagcgctg gtctttgcca gggaaggagt gatccagaag ctgcctggca 461

gcattttgtg gggctggtca gggaatgggg tgtaaatgac aacagatatt aagggctctt 522

gtgagtagag caaggagttg ggtacagaat attcttcagc tggtctagca gaaatggaat 582

ctgcttcctg gtttcagctc tgcaggcttg gtatgtagga tgtctttaag ctttatggct 642

gatgccctaa agttctgtgt gtaaggatgc tctaaagtgt gaagtacaca gctgctgggc 702

tgggcaacta tagtgttttg ggagataaac agggcaagtg gcttgtctta ggtcatggtg 762

actggaatga ttttcagtac tagggcaatc attctgactt aattccaggg gtagggtgat 822

gggagttgag gaacctcagt ccatccctgg ctgctgtgga ctaagcactg actttgacaa 882

gctgagactg ctaagtcttt gtcctgtcct gcccggctgg gtagtgggga gtaagaagct 942

gaaagggagg tgggactttc cacgatagtg gcctcctgga gcttccactc ttctttccct 1002

acaggctcat agttcctaca cagctactgg cttctctgtt ttgaggcagt ttccttcttg 1062

ggggtttcct tgataaagtt atgggcttgg gtgcccattg tcccccatgc cactgagctt 1122

gttctagagt tcgaggacca tagaaggggc ctccaaagat tccttctggg atctttcccc 1182

attatctttt catcctacca gtcagaggga gggtcattat tggatatcta ctgtttactc 1242

acgtattgga tggaggtggt gcccaccctc ttggcag ag aca aag att cca gcc   1296
                                        Lys Thr Lys Ile Pro Ala     22

act gat gtc gct gat gcc agc ctg aat gaa tgt tcc agt acc gaa agg   1344
Thr Asp Val Ala Asp Ala Ser Leu Asn Glu Cys Ser Ser Thr Glu Arg     38

aaa caa gac gta gtg ttg ctg ttc gtg acc ttg tcc cac aca cag cca   1392
Lys Gln Asp Val Val Leu Leu Phe Val Thr Leu Ser His Thr Gln Pro     54
```

FIG. 6B

```
cct ctg ttt cac ctg cct tat gtc cag aaa ccc tta atc tct aat gtg   1440
Pro Leu Phe His Leu Pro Tyr Val Gln Lys Pro Leu Ile Ser Asn Val     70

gag cag ctg atc ctg ggg atc ccg ggc cag aat cgc cgg gag ata ggc   1488
Glu Gln Leu Ile Leu Gly Ile Pro Gly Gln Asn Arg Arg Glu Ile Gly     86

cat ggc cag gat atc ttt cca gca gag aag ctc tgc cat ctg cag gat   1536
His Gly Gln Asp Ile Phe Pro Ala Glu Lys Leu Cys His Leu Gln Asp    102

cgc aag gtg aac ctt cac aga gct gcc tgg ggc gag tgt att gtt gca   1584
Arg Lys Val Asn Leu His Arg Ala Ala Trp Gly Glu Cys Ile Val Ala    118

ccc aag act ctc agc ttc tct tac tgt cag ggg acc tgc ccg gcc ctc   1632
Pro Lys Thr Leu Ser Phe Ser Tyr Cys Gln Gly Thr Cys Pro Ala Leu    134

aac agt gag ctc cgt cat tcc agc ttt gag tgc tat aag gtaagacatg    1681
Asn Ser Glu Leu Arg His Ser Ser Phe Glu Cys Tyr Lys               147

gagcctcgtt ctttctcttc tggggtcata ttgggatagc actaagtgct caactctcta 1741

ggcctggctc cttttgagtc aaggaagcca ttgaagttgg taattatgta atctagcact 1801

gatgcagtgt gtagcatctt ccccgccctg tgaccttatc ccttatcttt attcataaga 1861

aacatcagct tcctaaagat tgttctgaaa cagccctgat ccagcagctt ctccccaggc 1921

cctccttctc ccttcccatg tatccctgac aagtctactg atgcccttag atatgaggct 1981

gtggctatga ggcactcacc attctgccat ttgtttctgc ag agg gca gta cct    2035
                                          Arg Ala Val Pro     151

acc tgt ccc tgg ctc ttc cag acc tgc cgt ccc acc atg gtc aga ctc   2083
Thr Cys Pro Trp Leu Phe Gln Thr Cys Arg Pro Thr Met Val Arg Leu    167

ttc tcc ctg atg gtc cag gat gac gaa cac aag atg agt gtg cac tat   2131
Phe Ser Leu Met Val Gln Asp Asp Glu His Lys Met Ser Val His Tyr    183

gtg aac act tcc ttg gtg gag aag tgt ggc tgc tct tga gataccccaa    2180
Val Asn Thr Ser Leu Val Glu Lys Cys Gly Cys Ser  *                 195

agcctcctac tggcctcagg gccacctaag tctcaggact ttagtagggg gtgggattac 2240

ttttcatagc aagtagagct ctttgaaggg aggtgggatt tggtttgttt ctcaaagcac 2300

agcaagaagg ttggcattat ggcagtaacc cctcatagat gcttctcttt gatgtggcag 2360

gggcccccta gtgctgttct cagtcactcc tactactggg aagctgggcc cattgagatg 2420

tctgactatc gctgtcctag attgtgagtg ggctgggctt agtgccacct ctgggatcat 2480

ttaggtgggg aaagaggaac tggaattgga cgcatgtcag ctcttggggt aggggtaaaa 2540

ttgttaccag tgttaagctg gctttggact ctttctgagc cattcagctg ctatcatcct 2600
```

FIG. 6C

```
tctctgtacc attggcctgg ggctggtcca gaactgacct cagcatgtac attcctcctc 2660
acctaacact cctggcctct ttagagggag tgaagactct gtggaagaaa gcattctgtc 2720
atgggctagt catgggtaaa gggccccaag gccttcacaa cctggtgtca gatgggagcc 2780
tgagagtaga ggatgttgct tgactgacag agggggcctc tggcctcatg gaaagtttgt 2840
ctcactatca tttaaggaac ttgatattag ctttttcact atctttaata aaactatagg 2900
accattgttg tgggtctctt atgttggata tctattactt                      2940
```